

TAXONOMIC NOTES ON TEXAN AND MEXICAN SPECIES OF *HEDYOTIS*
AND *HOUSTONIA* (RUBIACEAE)

Edward E. Terrell

Department of Plant Biology, University of Maryland, College Park, Maryland 20742
U.S.A.

ABSTRACT

Recent taxonomic papers by B.L. Turner concerning Texan and Mexican *Hedyotis* and *Houstonia* are reviewed. Diagnostic characters for *Hedyotis* and *Houstonia* are discussed briefly. Two subspecies of *Houstonia acerosa* are recognized: subsp. *acerosa* and subsp. *polypremoides*. A key and distribution map of *H. acerosa* are provided. *Houstonia palmeri* is retained without varieties pending further study. One of three new varieties of *Hedyotis nigricans* established by Turner (var. *gypsophila*) is accepted here as taxonomically valid. A new species, *Hedyotis pooleana*, created by Turner, is synonymized under *H. mullerae*.

KEY WORDS: Rubiaceae, *Hedyotis*, *Houstonia*, systematics, México, Texas

The following commentary discusses taxonomic data on *Hedyotis* and *Houstonia* published by B.L. Turner (1995a-d). His four papers in the July and August 1995 issues of *Phytologia*, owing to a lag in publication for this journal, were published in spring 1996, only about two months prior to the publication on June 10 of my monograph on *Houstonia* (Terrell 1996). I am now taking the opportunity to comment on Turner's papers.

First, I wish to comment on Turner's circumscription of *Hedyotis* and his placement of *H. acerosa* and *H. palmeri* in *Hedyotis* rather than *Houstonia*. In my monograph (Terrell 1996) I circumscribed *Houstonia* to include 20 North American species. *Hedyotis* includes a broad heterogeneous array of species mostly native to Asia, with North and South American species presently in *Hedyotis* considered more distantly related to and probably not congeneric with the Asian species. My monograph provided illustrations of representative seed types demonstrating that *Houstonia* seeds are always crateriform, *i.e.*, have a ventral cavity, concavity or depression. In the subgenus *Houstonia*, the seeds have a rounded ridgeless cavity; in the subgenus *Chamisme*, the concavities or depressions have a hilar ridge. In contrast, the vast majority of *Hedyotis* species are non-crateriform, thus lack a ventral

cavity, concavity, or depression. Those very few species which have cratenform seeds have other features setting them distinctly apart from both genera, and their proper classification is being studied. The seeds of *Oldenlandia* are also non-crateriform, but are quite different in being conic or trigonous and much smaller and more numerous. These three genera also differ from each other in basic chromosome numbers (see Terrell 1996) and are thus genetically isolated.

Houstonia acerosa (A. Gray) Bentham & Hooker f. (*Hedyotis acerosa* A. Gray)

It is sometimes difficult in classifying a species to know whether to emphasize the morphological extremes as subspecies or varieties, or whether to emphasize the existence of much morphological overlap as indicative of there being just one variable species without infraspecific entities. In the case of the variable *Houstonia acerosa* (alias *Hedyotis acerosa*) previous authors have tended to recognize the existence of two varieties or subspecies. In 1996, impressed by the extensive intergradation, I circumscribed *Houstonia acerosa* as just one variable species without infraspecific entities. The opposite extreme was followed by Turner (1995b), who recognized four varieties: *Hedyotis acerosa* var. *acerosa*, var. *polypremoides* (A. Gray) W.H. Lewis, var. *potosina* B.L. Turner, and var. *tamaulipana* B.L. Turner.

After re-considering the variation in *Houstonia acerosa*, I now believe that despite considerable intergradation, the two morphological extremes (see key below) and their partial but definite geographic separation (Figure 1) are sufficient to support their recognition as subsp. *acerosa* (Texas to San Luis Potosí) and subsp. *polypremoides* (New Mexico and western Texas to Chihuahua and Coahuila), as previously published in 1979, rather than as varieties. The differences between these two entities are on a level higher than the usual variety. In addition, the geographical separation in New Mexico and adjacent lands is clearly marked, despite intergradation in western Texas and northern México.

Turner (1995b) stated that var. *acerosa* and var. *polypremoides* differ (among other characters) in the presence or absence of down-curved stem hairs; however, I could not find these hairs and interpret the vestiture as usually densely puberulent with very short hairs. (It may be noted that in his key to Mexican species Turner [1995b] erroneously listed a "var. *fasciculata*", which should have been listed as var. *acerosa*.) The following synonymy is summarized from Terrell (1996); the types are cited in the monograph.

- Houstonia polypremoides* A. Gray, Proc. Amer. Acad. Arts 21:379. 1886. *Hedyotis polypremoides* (A. Gray) Shinnars, Field & Lab. 17:168. 1949. *Hedyotis acerosa* A. Gray var. *polypremoides* (A. Gray) W.H. Lewis, Ann. Missouri Bot. Gard. 55:31. 1968, *nom. superfl.* *Houstonia acerosa* (A. Gray) Bentham & Hooker f. subsp. *polypremoides* (A. Gray) Terrell, Brittonia 31:168. 1979.
Houstonia polypremoides A. Gray var. *bigelovii* Greenman, Proc. Amer. Acad. Arts 32:291. 1897. *Hedyotis acerosa* A. Gray var. *bigelovii* (Greenman) W.H. Lewis, Ann. Missouri Bot. Gard. 55:397. 1969.

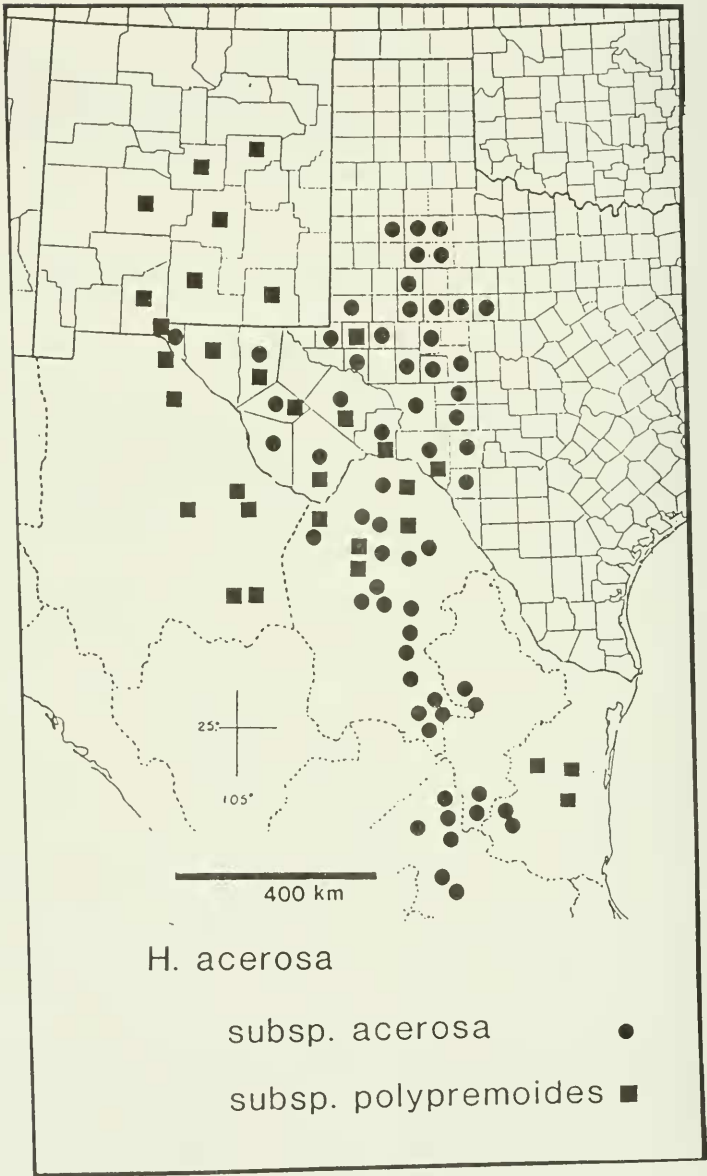


Figure 1. Distribution of *Houstonia acerosa* subsp. *acerosa* (circles) and subsp. *polyremoides* (squares).

Key to subspecies of *Houstonia acerosa*

1. Stems densely leafy; internodes usually 3-10 mm long; leaves mostly verticillate, fasciculate, numerous, often crowded and overlapping, acerose; flowers and capsules sessile or on pedicels to 3 mm long, sometimes densely grouped.
.....subsp. *acerosa*
1. Stems not densely leafy; internodes usually 10-25 mm long; leaves opposite or some verticillate, not or some leaves fasciculate, not crowded or overlapping, linear or acerose; flowers and capsules on pedicels 3-22 mm long, the inflorescence often open and diffuse.subsp. *polypremoides*

The remaining two varieties of *Houstonia acerosa* are discussed as follows.

Var. *potosina* B.L. Turner has low, pulvinate, mat-like plants with much-shortened internodes and long corolla tubes (8-10 mm long), and occurs from southernmost Coahuila to San Luis Potosí. In 1996 I considered these low plants as part of a cline that northward has taller plants with coarser leaves and longer internodes. In southern Texas there are collections that are somewhat transitional, with rather fine leaves and small stature (e.g., *Lewis 5517*, Pecos Co.; *Orcutt 734*, Terrell Co.; and *Palmer 11057*, Valverde Co.; these at US). In corolla tube length there appears so much overlap that this character is not diagnostic. For these reasons I cannot recognize this new variety, and synonymize it under subsp. *acerosa*. The type specimen of *Hedyotis acerosa*, *Wright 237* (see Terrell 1996), was collected in "Western Texas to El Paso, New Mexico" in 1849, and consists of plants like those cited above.

Var. *tamaulipana* B.L. Turner differs from var. *polypremoides* in having corolla tubes mostly 3-4 mm long and calyx lobes 1.5-2.0 mm long, compared to 4-7(-12) mm long and 2-5(-7) mm long. Turner (1995b) cited a type and two other collections from Tamaulipas. I was previously aware of these different-looking collections, had examined them in detail after borrowing them on loan twice from TEX, and cited and mentioned them (Terrell 1996:91), while including them in *H. acerosa* sens. lat. My study of them confirmed Turner's measurement for the corolla tube lengths, however, for calyx lobe lengths I found 1.0 to 2.6 mm. The three collections grew on habitats described as "short brush", "short brush on calcareous terraces", and "shale hill". The plants were generally rather short, wiry-stemmed, and had consistently spreading, diffuse inflorescences. The calyx and corolla tube lengths are the only differences by which var. *tamaulipana* differs from subsp. *polypremoides*. The stem and inflorescence characters of var. *tamaulipana* are similar to those of subsp. *polypremoides*; in fact, the Tamaulipan plants tended to have a closer resemblance to collections of subsp. *polypremoides* from the Davis Mountains, Jeff Davis County, Texas (e.g., *Rollins & Chambers 2759* [US]). Although var. *tamaulipana* occupies a distinct area to the south of collections of subsp. *polypremoides*, its morphological differences are minor and overlapping, and I prefer to synonymize it under the variable subsp. *polypremoides*.

Houstonia palmeri A. Gray (*Hedyotis palmeri* [A. Gray] W.H. Lewis)

This Mexican species occurs in Coahuila, Nuevo León, and San Luis Potosí (Terrell 1996). Turner (1995c) described var. *muzquizana* from the Múzquiz area of northern Coahuila. It differs from var. *palmeri* in having corolla tubes (6-)8-10 mm long and pedicels mostly 20-30 mm long, versus 4-5(-8) mm long and 5-20 mm long. In my treatment (1996) of *Houstonia palmeri* I recognized only one variable species, but commented (p. 94) that plants in the Múzquiz area have the longest corollas. Collections from the Múzquiz area that were formerly available to me did not seem sufficiently different from the many specimens from farther south to merit varietal status. Recent loans of var. *muzquizana* (two collections from TEX, one US) bear out Turner's measurements of corolla tube lengths, but show some overlapping in pedicel lengths in the two varieties. My presently limited sample leaves me reluctant to accept the existing morphological data as conclusive concerning var. *muzquizana*, pending further collecting of it.

Hedyotis nigricans (Lamarck) Fosberg, Lloydia 4:287. 1941.

The third species studied by Turner (1995a) belongs to *Hedyotis*, and was therefore not included in my *Houstonia* monograph. *Hedyotis nigricans* is a polymorphic species ranging from Ohio and Kentucky across the southeastern United States to Florida and the Bahamas, west to eastern Colorado and New Mexico, and south to central México. Terrell (1986; under *Houstonia*) provided a partial synonymy, and discussed two varieties occurring in Florida. Terrell (1991) summarized names and other data for the North American species of *Hedyotis*.

Hedyotis nigricans and several related species including *H. mullerae* Fosberg have non-crateriform, ellipsoid seeds with a centric punctiform hilum. Chromosome numbers in this group are known only for *H. nigricans* ($x=9, 10$). Seed morphology in the group differs distinctly from those of other Hedyotideae. The chromosome number of *Oldenlandia* is generally $x=9$, but this genus is quite distinct from *Hedyotis*.

Turner (1995a) established three new varieties in *Hedyotis nigricans*. Var. *austrotexana* differs in being papillose with "extended epidermal cells" on the calyces, stems, and leaves. Plants are simple-stemmed and non-bushy herbs 20-40 cm tall and occur in several counties in southern Texas. The var. *papillacea* from the panhandle and trans-Pecos Texas is similar to the preceding variety in the papillose vestiture, but the plants are sprawling low bushy herbs 5-15 cm. tall.

A few specimens of these varieties were lent to me from TEX, and the BRIT herbarium was visited in March, 1996. The characters, especially those concerning habit, separating these varieties seem to me to be minor. In the course of studying *Houstonia* species I have examined and collected many specimens of *Hedyotis nigricans* from Texas and elsewhere. Considering the great variability and wide range of *H. nigricans* I do not recognize the distinctness of these two varieties, and refer them to synonymy.

The third entity, var. *gypsophila* B.L. Turner, occurs in northern México. I have been familiar with these plants for some years, and would have described them as var. "elliptifolia", had I been less of a procrastinator. The variety has elliptical leaves and plants are consistently decumbent and short. Turner described the leaves as 3-6 mm wide, 2.5-3.5 times longer than wide, and the calyx as being setose with thickened hairs. I recognize this as a distinct variety. I was unaware of a preference of these plants for gypseous soils, as numerous collections recorded by me do not mention such soils.

Hedyotis pooleana B.L. Turner

Turner (1995d) described this new species from the Dead Horse Mountains, Brewster Co., Texas. It is closely related to *Hedyotis mullerae*, a low, compact, subshrub of Coahuila. I previously examined a number of specimens of *H. mullerae* from ASU, ENCB, GH, NY, TEX, and US. I have found *H. mullerae* to be rather variable in leaf size and shape, leaf vestiture, and compactness. Unfortunately, the only characters selected by Turner to distinguish *H. pooleana* have to do with the stem leaves, and these do not seem to be much different from some specimens of *H. mullerae*; consequently, I refer *Hedyotis pooleana* to the synonymy of the variable *H. mullerae*. Turner stated that the Dead Horse Mountains are an extension of the Sierra del Carmen of Coahuila, where *H. mullerae* is known to occur.

ACKNOWLEDGMENTS

I thank B.L. Turner, Director of TEX herbarium, for a loan of selected specimens. I am also grateful to the curators of the other herbaria cited in the text. I acknowledge helpful reviews by J. Henrickson and J.L. Reveal, and useful taxonomic data from Henrickson. This work was supported in part by Project F-12 of the Maryland Agricultural Experiment Station and Cooperative Extension Service.

LITERATURE CITED

- Terrell, E.E. 1986. Taxonomic and nomenclatural notes on *Houstonia nigricans* (Rubiaceae). Sida 11:471-481.
- _____. 1991. Overview and annotated list of North American species of *Hedyotis*, *Houstonia*, *Oldenlandia*, and related genera. Phytologia 71:212-243.
- _____. 1996. Revision of *Houstonia* (Rubiaceae-Hedyotideae). Syst. Bot. Monog. 48. 118 pp.
- Turner, B.L. 1995a. Taxonomic overview of *Hedyotis nigricans* (Rubiaceae) and closely allied taxa. Phytologia 79:12-21.
- _____. 1995b. Taxonomy of the *Hedyotis acerosa* (Rubiaceae) complex. Phytologia 79:83-88.

- _____. 1995c. Taxonomic study of *Hedyotis palmeri* (Rubiaceae). *Phytologia* 79:89-92.
- _____. 1995d. *Hedyotis pooleana* (Rubiaceae), a new species from the Dead Horse Mountains, Trans-Pecos Texas. *Phytologia* 79:93-96.